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FY 1999 - FY 2001

The Bureau of Reclamation has thousands of miles of water distribution canals, rights-of-way, wetlands, wildlife resources, recreational areas, and reservoirs whose operations and functions are incapacitated by invasive weed and algae species. These pests often produce large volumes of vegetation, which obstruct water flow, prevent access for maintenance and recreation, cause structural damage, and otherwise negatively affect system operation, water quality, and wildlife habitat. Millions of acre-feet of water are lost annually as a result of such infestations.

Objectives of this research are to find, develop, and provide effective control methods to reduce or eliminate invasive species without disrupting Reclamation facility operations or adversely affecting environmental constituents and processes.

Algae Control: In 1998, long-term application (30 days) of a high concentration of bacteria was applied to the Closed Basin canal to control troublesome algae. The bacteria was successful in reducing chlorophyll at specific sampling points and reducing odors at checks structures, but was not able to reduce accumulated biomass. Further investigations of endemic bacteria are warranted.

In 1999, five aquatic herbicide applications were conducted on the Closed Basin Canal to control troublesome algae. Four of the five applications were tank mixtures of approved aquatic herbicides applied at significant concentrations below label rates for periods of 6-8 hours. Initially, algae was controlled for only 0.3 miles downstream from the application site. Extremely low linear canal flows and dense algae growth contributed to rapid absorption of the applied aquatic herbicides within 0.5 miles downstream from the application site, thus reducing efficacy farther downstream.

Biocontrol of Weeds: Biological control projects using insects are in place at the following Reclamation locations: Oakes, North Dakota (leafy spurge), Red Bluff, California (yellow starthistle), Pueblo, Colorado (saltcedar), and Ephrata, Washington (purple loosestrife). Biocontrol insect populations have established successfully at all locations, and insects and target/nontarget plants are being monitored. The leafy spurge and yellow starthistle projects are showing some impacts on the plants, but populations of the insects have not yet reached levels where significant weed control is seen. The first nationally successful overwintering of saltcedar leaf beetles gave an excellent supply of beetles for use in cage-studies (open releases not yet permitted), and nearly 3,000 beetles were shipped to cooperators in Texas, California, Nevada, and Wyoming. Purple loosestrife biocontrol continues to show remarkable results, and thousands of beetles were field-collected by participants at Reclamation-sponsored field days. Laboratory production of the purple loosestrife weevil continued, using an artificial diet method. Several thousand of these weevils have been released into field sites. Studies are being planned for investigation of the potential for insect control waterhyacinth and hydrilla in the Lower Rio Grande Valley.

We assisted the Navajo Nation, the State of Oregon, Spain, and the Talent Irrigation District in developing grass carp (a weed eating fish) plans for aquatic weed management in their irrigation systems. We also assisted the

Brazilian government in developing an aquacultural program for using grass carp in irrigation canals.

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Bureau of Reclamation - Eastern Colorado Area Office (Loveland, Colorado)
Bureau of Reclamation - Ephrata Office (Ephrata, Washington)
Bureau of Reclamation - Office of Policy
Bureau of Reclamation - Oklahoma-Texas Area Office (Austin, Texas)
Bureau of Reclamation - Pacific Northwest Regional Office
Bureau of Reclamation - Pueblo Field Office (Pueblo, Colorado)
Bureau of Reclamation - Red Bluff Field Office (Red Bluff, California)
Bureau of Reclamation - Remote Sensing Group
California Department of Food and Agriculture, Biological Control Program, Sacramento, California
City of Boulder, Colorado, Division of Mountain Parks
Colorado Department of Agriculture
Cornell University
Department of Agriculture - ARS, Grassland, Soil, and Water Research Lab (Temple, Texas)
Department of Justice, Federal Correctional Institution (Englewood, Colorado)
Elf Atochem
Farmers Independent Ditch Company (Greeley, Colorado)
Garrison Diversion Conservancy District (Carrington, North Dakota)
Jefferson County, Colorado - Weed and Pest Management Office
Government of Brazil - CODEVASF
Government of Spain - CEDEX
Navajo Nation - NAPI
North Dakota Department of Agriculture
North Side Canal Company (Jerome, Idaho)
Salt River Project (Phoenix, Arizona)
Talent Irrigation District (Medford Oregon)

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